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Occupational Outlook Quarterly

IN THIS ISSUE:

Money Value of an Education

Opportunities for Service in the Peace Corps

New Job Horizons in Missile and Spacecraft Manufacturing

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Bureau of Labor Statistics
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This publication is issued to provide counselors with current information on employment trends and outlook, based primarily on the continuous research and statistical programs of the Bureau of Labor Statistics. It supplements and brings up to date information in the Occupational Outlook Handbook. It is prepared with the advice and assistance of the --

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Prepared under the supervision of James J. Treires in the Division of Manpower and Employment Statistics, Harold Goldstein, Chief. Authors are staff members of the Division unless otherwise noted.

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MONEY VALUE OF AN EDUCATION

by Herman P. Miller
Bureau of the Census
U.S. Department of Commerce

Numerous studies, conducted under varying economic conditions, show that persons with more schooling tend to earn more money. This relationship seems reasonable if it is assumed that more schooling, particularly at the secondary school and college level, in some measure improves the productivity of the individual and thereby compensates for his investment of time, effort, and money.

On the other hand, it is by no means inevitable that money invested in education will pay dividends or that the rate of return will be constant over time. There is always the possibility, indeed the probability, that the higher incomes of those with more years of schooling are due in part to individual differences in intelligence, home environment, family connections, and other factors. It is, of course, almost impossible to measure the extent to which these factors enter into the relationship of education and income. There is, however, some evidence that "ability" as measured by scholastic achievement is highly correlated with earnings.

Since the present study makes no allowance for the personal and social costs incurred in the completion of additional schooling, the income gains associated with greater educational attainment, as shown here, are overstated. However, the available evidence suggests that, even if allowance were made for these costs, an investment in schooling pays, on the average, a better return than many other investments.

*Mr. Miller is special assistant, Office of the Director, U.S. Bureau of the Census. This article is based on his study, "Annual and Lifetime Income in Relation to Education: 1939-1959," published in the December 1960 issue of The American Economic Review, pp. 962-986.

Of course, there is no guarantee that an investment in education will be financially profitable in any given case. This fact seems obvious, but it is often ignored. In 1958, for example, about 2.7 million men with college degrees had annual incomes under $7,000, whereas 1.9 million high school graduates received more than this amount. How can we explain the fact that so many college graduates had lower incomes than these men with only a high school education? The explanation must be sought in differences in occupations as well as in the quality of education, the abilities and efforts of individuals, and many other forces that impinge on the observed relationship between income and education. For example, many individuals with perhaps average intelligence continue their schooling, whereas many individuals with high intelligence never get as much education as they might assimilate or use to advantage. Furthermore, training completed at inferior schools cannot be equated with equal amounts of time and effort spent in training at excellent schools. For these and many other reasons, it would be fallacious and perhaps even harmful to draw inferences about individual cases from the evidence presented here for the general population.

Although this article deals with the material rewards of an education, this does not imply that the more subtle satisfactions that come with greater educational attainment have been ignored. The cultural and social advantages associated with more schooling may well be worth their cost in time, money, and effort, even if the economic advantages should cease to exist. The only justification for focusing on the economic advantages is that, at present, they are the only ones capable of even approximate measurement.

Annual Income

Some of the basic statistics pertaining to the relationship between annual income and educational attainment are presented in table 1, which shows the variations in average (mean) annual income over the 1939-58 period for men with different amounts of schooling.[1] Women have been excluded because a large proportion of them are not in the labor market and many of those who work are employed on a part-time basis. For these and other reasons, the relationship between their income and education may be distorted in the statistics. In contrast, since practically all adult men are full-time workers, it can be assumed that any advantages gained from more schooling are reflected in their incomes.

In every year for which data are presented, the completion of an additional period of schooling was associated with higher average incomes. This finding supports similar conclusions drawn from numerous other studies dating back to the early part of the century. Although income levels have changed considerably during the past 20 years, the basic relationship between the extent of schooling and income appears to have remained much the same. Contrary to the expectations of some analysts, the economic advantages of completing additional years of schooling have not diminished in recent years.

Although income generally tends to increase with education, the attainment of a particular level of schooling (e.g., completing the fourth year of high school) yields a greater return than the completion of any of the years leading up to it. This difference may reflect a selection in terms of ability and application between those who do and those who do not complete their schooling. For example, in 1958, the average annual income for men who started high school but did not graduate was more than $400 more for each additional year of schooling than for men who had completed elementary school only. High school graduates, however, received almost $500 a year more per year of schooling than men who started high school but never graduated. Similarly, men who attended college but did not graduate had, on the average, about

[1] Statistics presented in this article are based on data from the 1940 and 1950 decennial censuses of population and the annual income surveys conducted by the U.S. Bureau of the Census since 1945.

Table 1. Mean income (or earnings)[1] for males 25 years of age and over, by years of school completed, selected years

Years of school completed	1939	1946	1949	1956	1958
Elementary:					
Total	$1,036	$2,041	$2,394	$3,107	$3,096
Less than 8 years[2]	([3])	1,738	2,062	2,613	2,551
8 years	([3])	2,327	2,829	3,732	3,769
High school:					
1 to 3 years	1,379	2,449	3,226	4,480	4,618
4 years	1,661	2,939	3,784	5,439	5,567
College:					
1 to 3 years	1,931	3,654	4,423	6,363	6,966
4 years or more	2,607	4,527	6,179	8,490	9,206

[1] Data for 1939 are restricted to persons reporting $1,00 or more of wage or salary income and less than $50 of other income and to native white and Negro males 25 to 64 years old only. Data for 1946 represent total money earnings. Data for 1949, 1956, and 1958 represent total money income.

[2] Includes persons reporting no years of school completed, not shown separately.

[3] Information not available.

$700 more per year of schooling than high school graduates. The comparable differential for college graduates was about $900 per year of schooling.

The educational level of the population has risen considerably during the past generation. The proportion of college graduates in the population has nearly doubled during the period, and the proportion of high school graduates has also risen dramatically. At the same time, the relative supply of workers with only an elementary education has declined. How has this increase in the supply of more highly educated workers affected income differentials? Have the incomes of college graduates, relative to other groups in the population, been pushed down because of the relative increase in their numbers or has the demand for their services increased sufficiently to offset any such tendency?

These questions cannot be answered categorically on the basis of available statistics. There is some evidence that elementary school graduates have had smaller relative gains in income than high school graduates, despite the reduction in their relative numbers. (See table 2.) In contrast, the relative difference in income between high school and college graduates has not changed much over time, and there is even some evidence that it has increased in favor of college graduates during the past few years.

Since 1946, for example, the incomes of high school graduates have risen considerably more, in percentage terms, than those of elementary school graduates. In 1946, the differential between these two groups was only $600, or about 26 percent. By 1958, the differential was about $1,800, or 48 percent. This change is in part related to the fact that a large proportion of the elementary school graduates are employed in occupations such as farmers, farm laborers, and nonfarm laborers which tended to have lower relative income gains in recent years than most other occupations.[2] It is also possible, of course, that even for occupations such as operatives and craftsmen, in which a relatively large number of elementary school graduates are employed,

[2] Median total money income of employed males increased between 1950 and 1958 by 3 percent for farm laborers, 51 percent for nonfarm laborers, and 27 percent for farmers. In contrast, the increase during this period was 57 percent for professional workers, 54 percent for managers and officials, and 55 percent for craftsmen.

Table 2. Mean income (or earnings)[1] by level of school completed, for males 25 years old and over, selected years

Year	Elementary-high school differential			High school-college differential		
	Average income		Percent difference	Average income		Percent difference
	Elementary school graduate	High school graduate		High school graduate	College graduate	
1939.....	(2)	$1,661	(2)	$1,661	$2,607	57
1946.....	$2,327	2,939	26	2,939	4,527	54
1949.....	2,829	3,784	34	3,784	6,179	63
1956.....	3,732	5,439	46	5,439	8,490	56
1958.....	3,769	5,567	48	5,567	9,206	65

[1] See footnotes to table 1.
[2] Information not available.

high school graduates received greater increases than persons who never attended high school.

In contrast with the changing relationship between the incomes of elementary school and high school graduates, there has been relative little change in the income differential between high school and college graduates. In 1939, the average income of college graduates was about $950 more (57 percent) than for high school graduates. In 1956, the absolute difference between the incomes of these two groups increased to $3,050, but the relative difference was unchanged at about 56 percent. By 1958, the absolute difference rose to $3,650, and the relative difference also increased to 65 percent. The data suggest that, during the recession years 1949 and 1958, the incomes of college graduates were less affected than those of other groups, perhaps reflecting a greater tendency for persons with less schooling to be unemployed. There is also some possibility that the income gains for college graduates partly reflect a rise in the proportion of men in this group with graduate school training. The influence of this factor is probably quite small, however, since there is no evidence of a sharp rise in the proportion of college men with graduate training. Moreover, the absolute difference in income between all college graduates and those with graduate training amounted to only about $200 in 1958.

Why has the relative income differential between high school and college graduates been generally maintained, and indeed recently increased, despite the large relative increase in the size of the college-trained population? One explanation may be that the demand for college graduates has kept pace with the supply. Because of the country's changing technology, the demand for trained workers has accelerated since the end of World War II, and industry has absorbed the increased flow of graduates from colleges and universities. The nature of this change is most evident from the sharp rise in the proportion of the labor force engaged in professional and managerial work, the two occupational groups in which the great majority of college graduates are employed. Since 1940, the proportion of men employed in these two groups combined has increased by about 50 percent.

Relation of Annual Income to Age and Education

As might be expected, additional years of schooling have little immediate impact on earnings. Inexperienced workers in most occupations start at a relatively low level of earnings which tend to increase as skill and experience are acquired. Therefore, the financial benefits of additional schooling tend to accumulate over time, and the greatest impact is felt during the period of peak earnings. These tendencies are clearly reflected in table 3 which shows the earnings at an average age of 30 (i.e., after about 10 years of work experience) and 50 (i.e., about the age of peak earnings) for men with different amounts of educational attainment.

In view of the limited range of earnings possible in most of the jobs for which elementary school graduates can qualify, it is not surprising that their annual earnings after a lifetime of work are not much higher than their initial earnings. College graduates, on the other hand, tend to choose careers in which the possibilities of high earnings are much greater and therefore have peak earnings which, on the average, far exceed initial earnings.

Since 1939, the differential between initial and peak earnings has decreased considerably for elementary and high school graduates, but has not changed much for college graduates. Evidently, among workers who have not attended college, the younger groups have succeeded in making greater relative gains in earnings than those with more experience. Between 1939 and 1949, these gains were probably due in large measure to reduced unemployment among the younger (and less skilled) groups. The further gains during the past decade may reflect the "across-the-board" wage increases stipulated in union contracts

negotiated during the postwar period which resulted in greater relative gains for lower paid workers. They may also reflect the gradual rise in the statutory minimum wage for many industries.

As previously noted, there was no reduction in the incomes of college graduates relative to high school graduates between 1939 and 1958, despite the great rise in the proportion of persons with a college degree. Among men 25 to 34 years old, the proportion of college graduates doubled between 1940 and 1959, whereas the proportion of men who terminated their schooling with elementary school graduation was reduced by two-thirds.

Table 3. Mean income (or earnings)[1] for males 25 to 34 years and 45 to 54 years of age, by level of school completed, selected years

Age group and level of school completed	1939	1946	1949	1956	1958
Elementary school graduate:					
25 to 34 years	([2])	$2,011	$2,540	$3,685	$3,663
45 to 54 years	([2])	2,629	3,247	4,289	4,337
Percent change	([2])	31	28	16	18
High school graduate:					
25 to 34 years	$1,335	2,335	3,246	4,813	4,909
45 to 54 years	2,256	3,744	4,689	6,104	6,295
Percent change	69	60	44	27	28
College graduate:					
25 to 34 years	1,956	3,237	4,122	6,307	7,152
45 to 54 years	3,575	5,242	8,116	11,702	12,269
Percent change	83	62	97	86	72

[1] See footnotes to table 1.
[2] Information not available.

Despite the relative decrease in the number of elementary school graduates 25 to 34 years old since 1946, their earnings have not risen as much as the earnings of high school graduates, and therefore the income differential between these two groups has widened. (See table 4.) Between 1946 and 1958, the earnings of elementary school graduates increased by about 82 percent, compared with an increase of about 110 percent for high school graduates and 121 percent for college graduates.

Lifetime Income

Estimates of lifetime income provide an insight into the financial returns associated with education which cannot be readily obtained from the annual income data. These estimates are derived from data showing variations in the income of individuals in different age and education groups at a given time, specifically the calendar years for which data are presented. The figures are, therefore, based on incomes of a cross-section of the male population in 1939, 1946, 1949, 1956, and 1958, and do not actually trace an individual's income from the time he starts to work until he retires.

Standard life-table techniques were used in computing the lifetime income figures shown in table 5. First, an estimate was made of the number of children born in 1939, 1946, 1949, 1956, and 1958 who would survive to each given year of age. By way of illustration, it was estimated from the appropriate life tables that of every 100,000 infants born alive in 1956 about 96,000 would survive to age 18, at which time they would enter the labor market. The basic problem consisted of estimating

Table 4. Mean income (or earnings)[1] by level of school completed for males 25 to 34 years old, selected years

Year	Elementary-high school differential			High school-college differential		
	Average income		Percent difference	Average income		Percent difference
	Elementary school graduate	High school graduate		High school graduate	College graduate	
1939	[2]	$1,335	[2]	$1,335	$1,956	47
1946	2,011	2,335	16	2,335	3,237	39
1949	2,540	3,246	28	3,246	4,122	27
1956	3,685	4,813	31	4,813	6,307	31
1958	3,663	4,909	34	4,909	7,152	46

[1]See footnotes to table 1.
[2]Information not available.

Table 5. Estimated lifetime income for males, by years of school completed, selected years

Years of school completed	1939	1949	1956	1958
	Income from age 18 to death			
Elementary:				
Total	[1]	$113,330	$154,593	$154,114
Less than 8 years	[1]	98,222	132,736	129,764
8 years	[1]	132,683	180,857	181,695
High school:				
1 to 3 years	[1]	152,068	205,277	211,193
4 years	[1]	185,279	253,631	257,557
College:				
1 to 3 years	[1]	209,282	291,581	315,504
4 years or more	[1]	296,377	405,698	435,242
	Income from age 25 to 64			
Elementary:				
Total	$37,172	91,932	127,047	127,286
Less than 8 years	[1]	79,654	108,310	106,449
8 years	[1]	106,889	148,033	149,687
High school:				
1 to 3 years	53,011	121,943	169,501	175,779
4 years	67,383	148,649	208,322	215,487
College:				
1 to 3 years	73,655	173,166	243,611	269,105
4 years or more	104,608	241,427	340,131	366,990

[1]Not available.

the life span of these survivors and the amount of income they would receive during their lifetime. For this purpose, it was assumed that survival rates for men in each education group would be the same as for all white males in 1956. On this basis, it was estimated that these 96,000 men would live a total of nearly 5 million man-years between age 18 and the time the last one died. It was further assumed that during each year of life, these men would receive an average income corresponding to that received by men in the same age group with the same amount of education in 1956. For example, as shown in table 5, it is estimated that a man born in 1956 who subsequently completes high school would receive a lifetime income of $253,631 (computed on the basis of the average income of male high school graduates in 1956).

It should be noted that the estimates presented in table 5 reflect the economic conditions and other circumstances which existed in each of the years for which data are shown. Some of the differences from year to year may reflect changes in these circumstances. The increase, for example, in the value of a college education by about $140,000 between 1949 and 1958 reflects the increase in prices as well as changes in many other economic factors. Moreover, no allowance is made for the possible intrusion of extraneous factors in the relationship between lifetime income and education.

In every year for which data are presented, additional schooling is associated with a very substantial increase in lifetime income. On the basis of conditions in 1958, an elementary school graduate could expect to receive during his lifetime about $52,000 (or two-fifths) more income, on the average, than the person who terminated his formal education before completing the eighth grade. The difference, on the average, between the expected lifetime income of an elementary school and a high school graduate was equally striking. In 1958, an elementary school graduate could expect, on the average, a lifetime income of about $182,000 compared with approximately $258,000 for a high school graduate, a differential of about $76,000, or 42 percent.

Since a college degree is required for many, if not most, high-paying jobs, it should come as no surprise that the greatest income gains associated with additional schooling appear at the college level. On the basis of 1958 data, a college graduate could expect to earn about $435,000 during his lifetime, compared with $258,000 for the high school graduate. It can, therefore, be estimated that the years of schooling beyond the high school level resulted in an increase of about $177,000 in lifetime income, or about $40,000 for each additional year.

Since 1939, the more highly educated groups have clearly made the greater relative gains in expected lifetime income. Thus, for example, in 1946, high school graduates could expect to earn only 35 percent more between the ages of 25 and 64 than elementary school graduates (table 6). Twelve years later, the differential in favor of the high school graduates increased to 44 percent, reflecting the fact that the expected income of high school graduates rose more rapidly during this period.

A comparison of the relative income gains that could be expected by high school and college graduates reveals essentially the same pattern. Evidently, the differential in favor of college graduates dropped from 55 percent in 1939 to 48 percent immediately after the end of the Second World War, probably because a larger proportion of the college graduates continued to serve in the Armed Forces during part of 1946. By 1958, however, the differential between high school and college graduates rose to 70 percent, reflecting a greater relative income gain for the college group. These figures support the conclusion presented earlier that the large increase in the number of college graduates during the postwar period has not adversely affected their income position.

* * * * *

This study raised the question whether or not the marked increase in

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Table 6. Estimated income received from ages 25 to 64, for males, by level of school completed, selected years

Year	Elementary-high school differential			High school-college differential		
	Elementary school graduate	High school graduate	Percent difference	High school graduate	College graduate	Percent difference
1939.....	([1])	$67,383	([1])	$67,383	$104,608	55
1946.....	$84,687	114,023	35	114,023	168,983	48
1949.....	106,889	148,649	39	148,649	241,427	62
1956.....	148,033	208,322	41	208,322	340,131	63
1958.....	149,687	215,487	44	215,487	366,990	70

[1]Information not available.

the number and proportion of high school and college graduates during the past generation has been associated with a reduction in income differentials for these groups. Theoretically, such a reduction could be expected in the long run, assuming no changes in the demand for more highly educated workers. The period under consideration, however, was relatively short and was one in which there were changes in the demand for, as well as in the supply of, such workers. Therefore, no fundamental theoretical issues are involved in this study. The problem is merely one of ascertaining what has taken place and why.

The figures show that the large relative increase in the supply of high school and college-trained workers did not adversely affect their relative income positions. On this basis, it is concluded that the demand for more highly educated workers has kept pace with the increased supply of such workers and, as a result, their relative income position has not changed.

NEW DIRECTORY OF APPROVED VOCATIONAL COUNSELING SERVICES

The 1961-62 edition of the Directory of Vocational Counseling Services has recently been issued by the American Board on Professional Standards in Vocational Counseling, Inc., a semi-independent board created and sponsored by the American Personnel and Guidance Association. The Board, whose members are elected from outstanding persons in the counseling and guidance profession, carefully reviewed the standards of the 165 vocational counseling services listed in the Directory to determine that they were fully qualified to provide professional vocational counseling.

Information in the Directory includes the name and address of the approved counseling service or agency (listed by State), type of services offered, clientele served, fees charged, name and professional qualifications of the director, and the number of positions on the staff. This 116-page publication may be obtained from the American Personnel and Guidance Association, 1605 New Hampshire Avenue, N.W., Washington 9, D.C. (Price, $1.50)

OPPORTUNITIES FOR SERVICE IN THE PEACE CORPS*

by Robert S. Bryan
Office of Public Information
Peace Corps

College graduates and students, skilled workers, and other persons interested in contributing to world peace can now volunteer for service on overseas assignments with the newly established Peace Corps. Established by an Executive Order on March 1, 1961, the Corps adds a new dimension to America's mutual assistance program--providing a pool of trained manpower to aid newly developing nations struggling for economic and social progress.

The provision of skilled manpower through the Peace Corps will reinforce other mutual assistance programs which provide economic or technical assistance. Under these programs, most technical assistance advisors go as members of an official U.S. mission to demonstrate or advise; under the Peace Corps program, volunteers will work in the community to which they are sent, serving local institutions and living among the people they are helping. Thus, volunteers will provide the specific skills needed to put technical advice to work bridging some of the gaps that have heretofore obstructed America's efforts toward world peace.

Our own freedom, and the future of freedom around the world, depend, in a very real sense, on the ability of newly developing countries to build growing and independent nations where men can live in dignity, liberated from the bonds of hunger, ignorance, and poverty. One of the greatest obstacles to the achievement of this goal is their lack of trained men and women with the skill to teach the young and assist in the operation of development projects. Skilled people are urgently needed to help teach in the schools, construct development projects, demonstrate modern methods of sanitation in the villages, and perform a hundred other tasks calling for training and advanced knowledge. The Peace Corps will fill this need by recruiting and training volunteers in the United States and sending them abroad to work with the peoples of other nations--in Africa, Asia, the Middle East, Latin America, or any other area of the world where help is needed and wanted. Volunteers will not be limited to the young or to college graduates. All qualified individuals will be welcome to join this effort. But undoubtedly the Corps will

After training is completed, these surveyors will help develop feeder roads in a foreign country

*This article is based on the Peace Corps Fact Book, the basic source of information on the Peace Corps program and policies. Additional information is available in two other publications--Private Voluntary Agencies and the Peace Corps and Educational Institutions and the Peace Corps. These publications are available upon request to the Peace Corps, Washington 25, D.C.

be made up primarily of young people as they complete their formal education.

Programs of the Peace Corps

Although the Peace Corps is now operating on a temporary pilot basis, an estimated 500 to 1,000 volunteers will be in training or overseas by the end of 1961. Among the specific programs to which these volunteers will contribute are teaching, public health and sanitation projects, agricultural projects, both large- and small-scale construction projects, and government administration.

Teaching. Among the Peace Corps programs, great emphasis will be placed on teaching, since literacy and higher levels of knowledge and skills are a prerequisite to successful national development. In most newly developing nations, the shortage of teachers is a major bottleneck. Since in many African and some Asian countries teaching is conducted in English, U.S. college graduates could play a vital role teaching in primary, secondary, and trade schools. In many other developing nations, the teaching of English is wanted. And in Latin America the teaching of literacy in Spanish is required--a useful field for Spanish-speaking U.S. graduates.

Health Projects. Personnel are needed for work in innoculation campaigns against typhoid, smallpox, and tetanus, and in water sanitation programs. Instruction in personal hygiene and nursing techniques is needed.

Agricultural Projects and Rural Development Programs. In addition to top-level technical advisors already being provided by other mutual assistance programs, skilled agricultural workers are needed to assure the effectiveness of demonstration programs for animal husbandry, new farm techniques, improvement of seed, and irrigation. Peace Corps volunteers will work alongside the citizens of foreign nations in their community development programs.

In many countries, the educated young people cannot be persuaded to return to the villages or to do manual labor. The presence of U.S. volunteers can challenge them to undertake this essential work and contribute to the spirit of national service needed for the mobilization of their country's full human resources. While it would not be generally practical for the Peace Corps to supply unskilled manual labor, in many places the shortage of any skills is so great that there is a real need for semiskilled Peace Corps volunteers who can assist with the construction of schools, self-help housing, feeder roads, and other small-scale public projects.

Large-Scale Construction and Industrial Projects. On most of the large dams as well as in valley development, construction of new cities, or establishment of modern factories, employment of skilled operating personnel from outside has been necessary to do a wide range of skilled and semiskilled jobs. If proper terms of service can be arranged, Peace Corps volunteers from trade unions or U.S. businesses can provide some of the needed help, including on-the-job training of local personnel.

Government Administration. Many Peace Corps volunteers will also be needed in public administration, at all levels, including urban development.

All these projects will be developed jointly by the Peace Corps and foreign nations, or with the help of voluntary agencies, universities, or United Nations agencies. In every instance, the foreign nation must favor the project, and volunteers will be sent only to countries where they are welcome. The Peace Corps will respond to the requests of foreign nations to the extent that its resources and personnel permit.

Volunteers may request duty in particular areas, but the Peace Corps will not guarantee assignment to specific locations. An effort will be made, however, to match a volunteer's special background, knowledge, and experience

A professor of geology prepares trainees to do geological mapping in Tanganyika, Africa

to geographical areas where he could function most effectively.

Recruitment and Selection of Volunteers

In many cases, the Peace Corps will assume the entire responsibility for the recruitment and training of volunteers and for the development of overseas projects. In other cases, it will make available a pool of trained applicants to private groups or universities who are carrying out projects approved by the Peace Corps.

In all cases, men and women recruited as a result of Federal assistance will be members of the Peace Corps and enrolled in the central organization. All private recruitment and training programs will adhere to Peace Corps standards as a condition of Federal assistance.

Any American citizen over age 18 may apply for membership in the Peace Corps, by filling out a questionnaire (available from the Peace Corps, Washington 25, D.C., or the nearest post office and at most colleges and universities). Parental approval will have to be obtained by volunteers who are under 21 and who live in States where persons under 21 are legally regarded as minors. There is no upper age limit. Married couples without dependent children can be accepted if both can do needed jobs. Older or retired people can be accepted if they meet Peace Corps standards and if they have special skills needed for Peace Corps proj-

ects. However, Peace Corps tasks will be performed under arduous living conditions, and for this reason it is expected that most volunteers will be from 21 to 45 years old. Older people may serve as instructors at training centers or as overseas supervisors.

Many applications for membership are expected, and selection will be on a highly competitive basis. Through written tests, physical examinations, interviews, and observation, candidates will be screened successively for technical competence, maturity, physical condition, and motivation. Procedures will be devised to prevent the selection of those who might seek to use the Peace Corps for subversive purposes. Because some persons otherwise qualified might prove to be emotionally incapable of facing the realities of living in distant outposts, it is of the highest importance that volunteers sent overseas possess qualities of stability, adaptability, determination, and other personal qualities which will enable them to fulfill the purposes of the program and represent the United States abroad with honor and dignity.

Training of Corpsmen

Training for the Peace Corps will be rigorous and intensive. Before leaving the United States, volunteers will receive 2 to 6 months of training at a college or university selected by the Peace Corps. Generally, training will include the following:

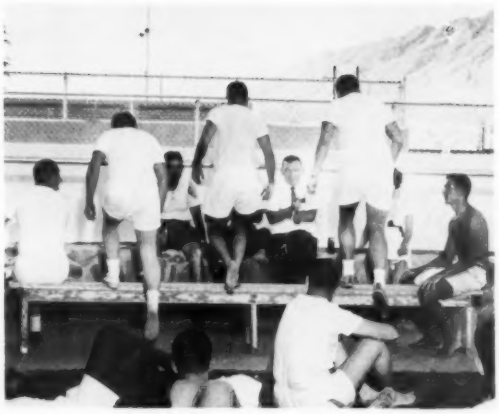
1. Study of the host nation's language;

2. Study of the history, customs, traditions, and economy of the host country;

3. Refresher courses in the volunteer's field of special skills, or in the techniques of the job ahead, such as special training in teaching English as a foreign language;

4. Physical conditioning, health and medical practices; and

5. Refresher courses in American Government, history, and traditions. Volunteers should be able to respond intelligently to questions about economics, history, social structure, government, and politics in the United States.



Trainees undergoing physical fitness tests

There will be great emphasis on language instruction and on preparation for the particular work assignment, such as teaching. There will also be briefings on practical problems of health and living in the country assigned.

Terms and Conditions of Service

The usual length of service in the Corps will probably be 2 years, with perhaps 3-year terms in some cases. Throughout the training period and the term of service, volunteers will be subject to separation from the Corps if they fail to fulfill their assignment.

For most volunteers, living conditions will be markedly different from those in their home environments. Many will live under relatively primitive conditions, often enduring physical hardship. The food may be strange, the water may need purification, and tropical disease may be prevalent. Travel may be on foot. Recreational facilities may be few or nonexistent. Entertainment may be limited to participation in the social life of the local people. Whatever the conditions, it is

essential that volunteers live on a standard approximately comparable with that of their counterparts in the host country if they are to further world peace through the development of good personal relationships and mutual understanding.

For all Corpsmen, service will mean a personal sacrifice. They will receive no regular salary payments. Instead they will receive allowances sufficient to provide the basic necessities and to maintain good health.

The U.S. Public Health Service will assume responsibility for the volunteer's health needs. Arrangements will be made with whatever health and medical facilities are available--local health facilities, U.S. military hospitals, or clinics of other American missions in the area. In some cases, the Peace Corps may send out doctors or health specialists with the volunteer teams.

Upon completion of his service, the volunteer will receive a readjustment allotment based upon his time overseas in the Peace Corps. This allotment, accumulated at the rate of $75 a month, will provide the returning volunteer with funds to live until he obtains other employment. Also, the Peace Corps has established a Career Planning Board to counsel returning volunteers on employment and educational opportunities and to assist them in finding jobs.

The future careers of these young men and women will be enriched by the experience of living and working in foreign lands and of knowing people of another culture as friends and fellow workers. They will possess a deeper understanding of the world and of the responsibilities of the United States in promoting world peace. They will have promoted international cooperation and good will toward their own country and acquired new skills to contribute to the Nation's supply of trained personnel. They will be a source of information and experience to aid the United States in formulating more effective plans for a permanent organization which will increase the welfare of all men and improve understanding among nations.

EMPLOYMENT IN THE ATOMIC ENERGY FIELD

Engineers, scientists, and supporting technical workers accounted for about one-third of the 126,000 workers employed by major Atomic Energy Commission contractors in 1960, according to data obtained in a recent survey conducted for the AEC by the U.S. Department of Labor's Bureau of Labor Statistics. This high proportion of professional and supporting technical workers reflects the concentration on research and development work in the atomic energy field and the highly technical nature of its production activities. Many highly skilled craftsmen were also employed--representing about 20 percent of total employment--in such work as the fabrication of experimental apparatus and the maintenance of complex machinery and equipment.

The largest single occupation reported was mechanical engineer. Other occupations with substantial employment were those of machinery repairman, physicist, chemical operator, all-round machinist, chemist, and electrical or electronic engineer, in the order noted.

The full report on the findings of the survey, Employment in the Atomic Energy Field: A 1960 Occupational Survey (BLS Bull. 1297), is available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price, 30 cents.

EMPLOYMENT PROSPECTS OF 1961 COLLEGE GRADUATES

by Maxine G. Stewart

At commencement ceremonies in June of this year, nearly a half million young people earned degrees--more than 400,000 earned bachelor's degrees and about 90,000 earned graduate degrees. Of these, some young women assumed full-time family responsibilities, a number of young men entered the military services, and other graduates planned to continue their studies. The majority of the 1961 college graduates, however, like those of other years, were interested in obtaining regular full-time employment. An estimated 300,000 entered the civilian labor force on a permanent, full-time basis.

These graduates came into the job market at a time when the country's unemployed numbered close to 5 million, when the outpouring of students wishing summer work exceeded 2 million, and when more than 750,000 new high school graduates were competing for permanent jobs. Despite this situation, reports coming into the Bureau last spring indicated that prospects for permanent employment were generally good for college graduates--that they would, for the most part, find jobs by or relatively soon after graduation.[1] This favorable situation was in sharp contrast with that faced by students looking for summer jobs, most of whom had a hard time finding work this year, and with the prolonged periods of unemployment reported for large numbers of experienced workers.

According to college placement officials, the economic situation prevailing last spring affected the nature of job offerings to graduating seniors but not the total number.

Reports indicated that recruiting activity on the college campuses remained at consistently high levels: The number of manufacturing firms sending recruiters declined somewhat, but this was offset by an increase in the number of recruiters from nonmanufacturing concerns. One college placement officer reported that industry this year seemed more willing to gamble on an upturn in the economy than was the case during the 1958 recession. Recruiters were reported as being highly selective, however. They appeared to be placing greater stress on grades this year than last, with the focus of interest on graduates in the upper third--in some cases the top tenth--of their class. Less accomplished students were not usually sought after by recruiters who came to the school placement offices; consequently, these students had to look for jobs in other ways. This was particularly true in the less well-known colleges and universities. Employers appeared to recognize that, in institutions with especially high admission and academic standards, completion of the curriculum is in itself a testimonial of the student's accomplishment. In all types of institutions, graduate degrees were reported to be of great value both in finding a job and in commanding the highest entrance salaries.

Hiring was especially brisk in the fields of education, accounting, engineering, and the health professions; these fields of work have for some time reported a shortage of trained people with a correspondingly high demand for the new college graduates. On the other hand, graduates who majored in the arts, humanities, and the social sciences were less sought after, although recruiters were frequently interested in liberal arts graduates with definite career objectives. This spring, as in the past, liberal arts graduates frequently had to

[1] This and other conclusions in this article are based on information obtained by the staff of the Bureau of Labor Statistics regional offices from college placement officers in different parts of the country, and also on the findings arrived at in connection with the forthcoming 1961 edition of the Occupational Outlook Handbook.

make many compromises to find a job, and some undoubtedly had to take jobs that underutilized their educational training. Many of them, however, planned to attend graduate school.

Despite this year's economic uncertainties, salary offers continued their upward climb and were reported to be from 2 to 4 percent above comparable offers last year. This increase, however, is in line with the general upward trend of all wages and does not necessarily represent increased bidding because of a shortage of applicants.[2] According to a nationwide survey,[3] beginning salaries averaged about $470 a month for men, but were somewhat less for women. Engineering graduates were usually offered the highest beginning salaries and liberal arts graduates, the lowest.

Altogether, it appears that the employment situation for this year's college graduates was generally favorable although not uniformly so. College graduates were obviously benefiting from the rapid expansion in employment that has characterized professional, technical, and kindred occupations in recent years and which has made this the fastest growing occupational group in the country. Moreover, there are continuing shortages of personnel in many professional and technical occupations, as well as managerial ones, which have helped to keep the unemployment rates relatively low in these occupations even during the recent recession. In May 1961, for example, the unemployment rate for the professional, technical, and kindred worker group--as well as for managers, officials, and proprietors--was less than 2 percent. In contrast, the unemployment rates for laborers (except farm and mine) and operatives and kindred workers were 14.6 and 10.1 percent, respectively. Thus, the situation this year continues to demonstrate the economic worth of a college education, in addition to its value as preparation for life and citizenship.

[2]Average hourly earnings of production workers in manufacturing industries increased from $2.28 to $2.32 between April 1960 and April 1961, despite the high levels of unemployment.

[3]"The Fifteenth Annual Endicott Report of Trends in the Employment of College and University Graduates in Business and Industry, 1961," Journal of College Placement, Bethlehem, Pa., February 1961, pp. 68-78.

NEW CHART BOOK ON THE UNEMPLOYED, SPRING 1961

Secretary of Labor Arthur J. Goldberg has emphasized: "Unemployment is more than a matter of statistics. It is a matter of people, of suffering, of unpaid bills, and of wasted skills. It is something our country and our people cannot afford."

A new chart book, Who Are The Unemployed?, published by the U.S. Department of Labor, examines and graphically illustrates unemployment trends through April 1961, when 5 million Americans were out of work. It explains how employment and unemployment data are collected and what the statistics mean. It also charts information about who were unemployed in the Spring of 1961, where they lived, and the broad occupational groups and industries from which they came.

Single copies of this 25-page chart book, prepared by the Bureau of Labor Statistics and the Bureau of Employment Security, are available from the U.S. Department of Labor, Washington 25, D.C.

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HIGH SCHOOL GRADUATES AND DROPOUTS IN THE LABOR MARKET, OCTOBER 1960*

by Sophia Cooper

In June 1960, almost 1.7 million young men and women were graduated from the Nation's high schools. Four months later, almost half of these graduates were enrolled in college; a little over half had entered the Nation's labor force.

The expanding size of the second group--those entering the labor market upon completing high school--has elicited much concern about the problems these young people face in finding jobs and the kinds of opportunities which are made available to them. Of equal importance are the problems that face the growing number of new workers who drop out of school each year without graduating.

To a large extent, the health of the Nation's economy is dependent in the long run on the development and use of this sizable source of manpower--both the young people whose formal education ceases with high school graduation and those who quit before finishing high school. Information on the experiences of these high school graduates and dropouts who entered the labor force over the past 2 years not only gives counselors and educators a better understanding of the kinds of jobs their students find, but it also discloses to what extent the students have been successful in the prevailing labor market.

The June 1960 graduates included about 925,000 young women and 750,000 young men (table 1).[1] Nonwhites, who have persistently had a higher rate of dropouts than whites, represented only 7 percent of the high school graduates. In a job market affected by some economic slowdown, 85 percent of the graduates who entered the labor force were working in October; 15 percent were actively looking for jobs.

More than 340,000 boys and girls dropped out of high school between January and mid-October 1960. Although they managed to find jobs about as readily as those who graduated, the economic cost of not having a diploma and the training that it represents was evident in other ways--in the lower skills required for the jobs the dropouts could get compared with the skills required for the jobs available to the graduates, as well as in the smaller proportion of jobs providing a full week's work.

Graduates Enrolled in College

Three-quarters of a million June graduates--nearly 1 out of every 2--were attending college in October 1960. More than half (54 percent) of the men were enrolled, compared with 38 percent of the women. These proportions were the same as in 1959, but with the larger size of the 1960 graduating class, the number who chose to further their education was almost 100,000 greater. About 5 percent of the college enrollees were nonwhite.

*This article analyzes the results of the second nationwide survey of the employment of recent high school graduates and dropouts. The survey was made in October 1960 as a supplement to the regular monthly labor force survey, conducted and tabulated for the Bureau of Labor Statistics by the Bureau of the Census. The survey of June 1959 high school graduates, made in October 1959, was summarized in the May 1960 issues of the Occupational Outlook Quarterly and the Monthly Labor Review. The survey of the June 1960 high school graduates was published in the May 1961 issue of the Monthly Labor Review.

[1]Data presented in this article relate to persons 16 to 24 years of age in the civilian noninstitutional population living within the United States in the calendar week ending October 15, 1960. All members of the Armed Forces and inmates of institutions are excluded.

The high cost of a college education compels many students to do some kind of work for pay even at the beginning of their first year of college, when they are trying to adjust to the demands of school work. About 1 out of every 4 who entered college was either working or looking for work in October, 1960.

Graduates Not Enrolled in College

More than 900,000 June graduates did not enter college; most of them were in the labor force. Close to 90 percent of the 350,000 male graduates not enrolled in college were working or looking for jobs in October.[2] Of the young men not in the labor force, more than half were taking training in special schools, presumably to acquire more skill to offer potential employers.

Of the approximately 570,000 girl graduates who did not go on to college, 17 percent were married, and only 40 percent of this group were in the labor force. Those who were full-time homemakers accounted for more than a third of the women who were not in the labor force nor in college. About 125,000 women were enrolled in special schools offering nursing, secretarial, or other training. Among the single women who were not improving their job prospects by further training in special schools, about 90 percent were in the labor force--as high a proportion as among the men graduates.

Fifteen percent of the 1960 high school graduates who were in the labor

[2]In the discussion which follows, the term "high school graduates" will be used to mean those who were not enrolled in college.

Table 1. College enrollment and labor force status of June 1960 high school graduates in the civilian noninstitutional population, October 1960

[Thousands of persons 16 to 24 years of age]

College enrollment status, sex, color, and marital status of women	Civilian noninstitutional population		Civilian labor force		Not in labor force
	Number	Percent	Number	Percent of population	
Both sexes	1,679	100.0	881	52.5	798
White	1,565	93.2	820	52.4	745
Nonwhite	114	6.8	61	53.5	53
Enrolled in college	758	45.1	175	23.1	583
Full time	725	43.2	146	20.1	579
Part time	33	2.0	29	(1)	4
Not enrolled in college	921	54.9	706	76.7	215
In special schools	170	10.1	69	40.6	101
Male	756	100.0	420	55.6	336
Enrolled in college	408	54.0	112	27.4	296
Not enrolled in college	348	46.0	308	88.5	40
Female	923	100.0	461	49.9	462
Enrolled in college	350	37.9	63	18.0	287
Not enrolled in college	573	62.1	398	69.5	175
Single	473	51.2	359	75.9	114
Married and other marital status[2]	100	10.8	39	39.0	61

[1]Percent not shown where base is less than 100,000.

[2]Includes widowed, divorced, and separated women.

Note: Because of rounding, sums of individual items may not equal totals.

force were unemployed, and there was no significant difference in the rate of unemployment between the men and women (table 2). The unemployment rate was not significantly different from the rate of joblessness a year earlier among June 1959 high school graduates.

Types of Jobs Graduates Found

The kinds of jobs the graduates found were largely those which required little training. As in 1959, the greatest opportunities for the young women were in the clerical field, in which about 200,000, or 61 percent, of all the 1960 girl graduates found employment (table 3). Saleswork provided jobs for more than 10 percent of the young women. About 10 percent more were in service type jobs, including private household work.

The young men who had just graduated from high school found that more jobs were available in the semiskilled and unskilled manual occupations than in other kinds of work. The largest group of employed men graduates (close to one-third) found jobs as semiskilled operatives in factories or other industries. Eighteen percent had unskilled laboring jobs, and 15 percent were working in farm jobs. Only a small number were employed as craftsmen.

In general, graduates in 1959 and 1960 found very similar types of "entrance" jobs. Where there were differences, they suggest that the more desirable jobs were harder to find in 1960. There was some indication that more young men in 1960 were obliged to take the kinds of jobs which usually pay lower wages than was the case in 1959. For example, fewer of the 1960 male graduates were engaged in clerical and sales jobs, and a greater number were employed as laborers in nonfarm industries or as service workers. While there was a greater proportion in farm work than in 1959, this may have reflected only an increased need for farm labor. Weather and crop conditions in October 1960 may have temporarily kept

Table 2. Employment status of June 1960 high school graduates not enrolled in college and of 1960 school dropouts, 16 to 24 years of age, by sex, color, and marital status, October 1960

[Numbers in thousands]

Graduation status, sex, color, and marital status of women	Civilian noninstitutional population		Civilian labor force					Not in labor force
						Unemployed		
	Number	Percent	Number	Percent of population	Employed	Number	Percent of civilian labor force	
June 1960 high school graduates..	921	100.0	706	76.7	599	107	15.2	215
White	848	92.1	653	77.0	568	85	13.0	195
Nonwhite	73	7.9	53	(1)	31	22	(1)	20
Male	348	37.8	308	88.5	262	46	14.9	40
Female	573	62.2	398	69.5	337	61	15.3	175
Single	473	51.4	359	75.9	308	51	14.2	114
Married and other marital status[2]	100	10.9	39	39.0	29	10	(1)	61
1960 school dropouts	344	100.0	214	62.2	175	39	18.2	130
White	273	79.4	163	59.7	133	30	18.4	110
Nonwhite	71	20.6	51	(1)	42	9	(1)	20
Male	165	48.0	126	76.4	102	24	19.0	39
Female	179	52.0	88	49.2	73	15	(1)	91
Single	110	32.0	71	64.5	60	11	(1)	39
Married and other marital status[2]	69	20.1	17	(1)	13	4	(1)	52

[1]Percent not shown where base is less than 100,000.
[2]Includes widowed, divorced, and separated women.

Note: Because of rounding, sums of individual items may not equal totals.

Table 3. Major occupation group of employed June 1960 high school graduates not enrolled in college and of 1960 school dropouts 16 to 24 years of age, by sex, October 1960

[Percent distribution]

Major occupation group	June 1960 high school graduates			1960 school dropouts		
	Both sexes	Male	Female	Both sexes	Male	Female
Total employed:						
Number (thousands)	599	262	337	175	102	73
Percent	100.0	100.0	100.0	100.0	100.0	([1])
Professional, technical, and kindred workers	5.2	2.7	7.2	1.7	1.9	----
Managers, officials, and proprietors, except farm	.5	1.1	----	1.1	----	----
Clerical and kindred workers	38.9	10.7	60.9	10.9	4.8	----
Sales workers	8.4	5.0	11.0	5.2	2.9	----
Craftsmen, foremen, and kindred workers	3.5	7.3	.6	2.3	2.9	----
Operatives and kindred workers	17.4	31.7	6.3	23.0	28.8	----
Private household workers	2.8	----	5.1	8.0	----	----
Service workers, except private household	6.4	8.4	4.8	10.9	7.7	----
Farmers, farm managers, laborers, and foremen	8.9	15.3	3.9	23.0	27.9	----
Laborers, except farm and mine	8.0	17.9	.3	13.8	23.1	----

[1]Percent not shown where base is less than 100,000.

Note: Because of rounding, sums of individual items may not equal totals.

on the farm some young men who intended to seek nonagricultural work.

For the young women, the only significant differences in the jobs of the 1960 graduates, compared with those of the year before, could be interpreted as encouraging ones. A somewhat greater number of girls found jobs in the professional-technical occupations, and fewer were working in service occupations in 1960 than in 1959. The increase in the former group was in the medical and health field, probably student nurses or technicians; the drop in the service occupations covered both household workers and other kinds of service workers such as waitresses and housemaids.

Job Progress of June 1959 Graduates

The October 1960 survey of June 1960 high school graduates provided a means of following the employment progress of the graduates of the class of 1959. About 600,000 of these (1959) graduates were employed in both October 1959 and in October 1960.

For the group as a whole, some evidence of the benefits of the year of work experience acquired by these young men and women can be detected in a modest amount of upward shifting by the 1959 graduates toward jobs requiring more skill. Since the data provide only net changes over the year, specific patterns of individual shifts are not known.

Probably the most noteworthy development was one which affected only a small number of the earlier graduates. Six percent of the 1959 class held jobs in professional and technical occupations in October 1960, compared with a little over 1 percent a year earlier. The in-

crease was largely among young women employed in medical and health occupations, probably among student nurses and technicians. The increase for men was likely in subprofessional or technical jobs in which they were being trained.

Another significant increase occurred in the service occupations. Some of the 1959 graduates moving into service jobs probably came from farm jobs, which declined noticeably over the year. The additional young women in service occupations may have included some who a year earlier had been employed as semiskilled factory operatives--a group in which employment of women graduates diminished over the year. Another occupational group where employment of 1959 graduates diminished over the year was that of the salesworker, both men and women. Since sales jobs are often part time and casual, the decline here does not necessarily imply a downward shifting.

Employment of 1959 graduates in the craftsmen group of occupations showed no significant change between 1959 and 1960. This is not surprising, since many of the crafts require an extensive period of apprenticeship during which time the worker is classified as semiskilled.

School Dropouts, 1959 and 1960

The October 1960 survey confirms the facts, evident from other studies, that age 16 is the most common age at which youngsters quit school and that a sizable group does not attend school after 14 or 15 years of age. About 740,000 youngsters 16 and 17 years of age in October 1960 were not in school and had not completed high school. Of this group, only about 200,000 had quit school in 1960; over 270,000 had dropped out in 1959; over 190,000, in 1958 (at no more than 14 or 15 years of age); and almost 80,000, in 1957 or earlier (table 4). Approximately the same number of boys as girls had quit school at these various stages.

The 16-year-olds and the 17-year-olds who dropped out of school between January and mid-October 1960 accounted for 58 percent of all young persons who quit during this period. Another 37 percent were 18 and 19 years of age. Altogether, over 340,000 boys and girls left school in this period; about 540,000 left in the 12 months of 1959.

Employment of School Dropouts

Almost 40 percent of the girls who quit school in 1960 were married by October 1960, and most of them were not in the labor force. For the young men and the single women who quit school during 1960, the proportions in the work force were lower than for the 1960 high school graduates. About three-fourths of the young men dropouts were in the work force, compared with almost nine-tenths of the graduates; about two-thirds of the unmarried women

Table 4. School dropouts 16 and 17 years of age in the civilian noninstitutional population, by year last attended school and sex, October 1960

[Numbers in thousands]

Year last attended school	Both sexes		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
All years	739	100.0	367	100.0	372	100.0
1960	199	26.9	100	27.2	99	26.6
1959	271	36.7	123	33.5	148	39.8
1958	192	26.0	99	27.0	93	25.0
Prior to 1958	77	10.4	45	12.3	32	8.6

dropouts, compared with three-fourths of the graduates. Almost half the graduates who were not in the labor force, but only 8 percent of the dropouts, were taking some form of additional training in special schools.

The unemployment rate for young workers who quit school in 1960 was 18 percent. This was not significantly higher than that of 1960 high school graduates. However, in October 1960, the combined group of those who dropped out in 1959 and 1960 had a much higher unemployment rate (22 percent) than was true for the graduates of 1959 and 1960 (13 percent). Furthermore, dropouts were more likely to have longer periods of unemployment than were the unemployed graduates of the past 2 years. Almost 16 percent of the unemployed dropouts, but only 5 percent of the unemployed graduates, had been out of work for more than 6 months.

Types of Jobs Held by Dropouts

Women who do not complete their high school education before going to work are much less likely to be hired for office jobs than are graduates. Six out of 10 employed women graduates of June 1960, but only 2 out of 10 women who quit school in 1960 or 1959, were in clerical jobs.[3] These dropouts were much more likely to be factory hands (2 out of 10), housemaids, waitresses, or other kinds of service workers (more than 3 out of 10).

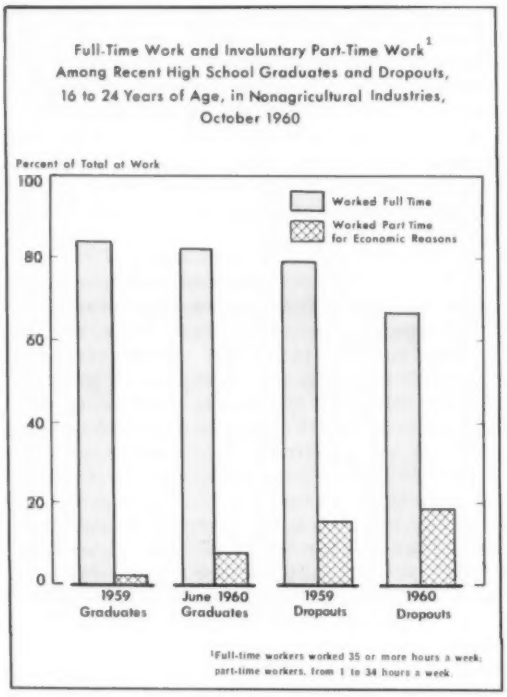
Almost equal proportions of the 1960 male graduates and dropouts (32 percent and 29 percent, respectively) were employed as semiskilled operatives. There were, however, significant differences in the distribution of employed men graduates and dropouts among the other major occupational groups. About 51 percent of the 1960 male dropouts, but only 33 percent of the graduates, were employed as laborers on farms and in industry. Only 10 percent of the dropouts, compared with almost 20 percent of the graduates, were employed in office, technical, and sales work. The craftsmen occupations also accounted for a larger proportion of the young graduates than school leavers--7 percent of the employed 1960 graduates, compared with 3 percent of the dropouts.

The contrast in farm employment between 1960 dropouts and graduates--23 percent compared with 9 percent--points to the fact that young persons in rural areas leave school to a greater extent than do those in urban areas. Moreover, these figures on employment in farm occupations undoubtedly understate the real difference in dropout rates, since some rural youths had probably already migrated and were working in urban areas by October 1960. Another important aspect of the rural dropout problem is indicated by the concentration of young nonwhite school leavers in farm work--about 45 percent of the nonwhite dropouts who quit school between 1958 and 1960. Of approximately 800,000 dropouts in 1958-60 who were employed in October 1960, about 180,000 were in farm jobs--a very large proportion, in light of the overall importance of agricultural employment in the economy--and almost 100,000 of the farm workers were nonwhite boys and girls.

Hours of Work, 1959 and 1960

The job market in October 1960 provided June graduates with about the same opportunities for full-time work as were available a year earlier to the 1959 graduates. More than 80 percent of each of these graduate groups who were at work in nonagricultural industries were employed full time (at least 35 hours a week) in the fall of the year in which they graduated. (See chart.) Some indication of a less favorable work situation in October 1960 could be found in a slightly reduced proportion who worked 41 hours or more--in line with the declining overtime work in the economy over the year. Furthermore, there was an increase over the year in the proportion who were employed part time

[3] The number of employed female dropouts in 1960 is too small for further meaningful classification by occupation because of sampling variability. Therefore, the dropouts for the two periods were combined.



for economic reasons, such as inability to find full-time work or cutbacks in hours resulting from slack work.

In October 1960, school dropouts experienced greater difficulty than did graduates in finding regular full-time work. Only two-thirds of the 1960 school dropouts who were working in nonfarm jobs were employed full time. Eight percent of the June 1960 graduates, compared with 19 percent of the dropouts, indicated they were working part time involuntarily.

With the addition of a year of labor market experience, a larger proportion of both the 1959 high school graduates and the dropouts succeeded in finding full-time jobs. Among the men who graduated from high school in 1959 and were at work in nonagricultural industries, 90 percent were working full time in October 1960, compared with 84 percent in 1959. Among the young workers who had dropped out of school, there was also evidence of a significant increase over the year in full-time employment.

VA ANNOUNCES OPENINGS IN TEN PROFESSIONS

The Veterans Administration has announced that its Department of Medicine and Surgery has job openings for qualified 1961 college and university graduates. Graduates in the fields of psychology, nursing, dietetics, clinical social work, occupational or physical therapy, corrective therapy, library science, recreation, and medical technology are especially in demand. The VA employs 90 percent of the Government's occupational therapists, 72 percent of the medical technicians, 60 percent of the psychologists, and 81 percent of the social workers. Many of the VA's 170 hospitals and 91 out-patient clinics have vacancies in one or more of these fields. Personnel who join the VA staff, therefore, frequently have a wide choice of location.

Interested graduates may contact the personnel officer of any VA hospital or clinic, or the Department of Medicine and Surgery, Veterans Administration, Washington 25, D.C. Information on opportunities in nursing may also be obtained from these offices. Qualifications for positions in the other 9 fields mentioned above are outlined in Civil Service examination announcements available from the regional offices of the U.S. Civil Service Commission, VA regional offices or hospitals, or from U.S. Post Offices.

NEW JOB HORIZONS IN MISSILE AND SPACECRAFT MANUFACTURING*

by Joseph F. Fulton

Hardly a day passes in which the American citizen does not see or hear at least one news item about the country's missile and space program. Names like Cape Canaveral, Project Mercury, and Polaris have become commonplace, and words like astronaut, countdown, and weightlessness are heard more and more. These developments have come about because of important recent changes in America's national defense needs and great new activity in exploring the space beyond the earth. We live in a time of exploration probably as exciting as the age of New World discovery several centuries ago.

The manufacture of missiles and spacecraft has become, within only a few years, a major source of jobs and is expected to provide even more jobs during the 1960's. Young men and women interested in participating in a new and expanding field of work might well examine the employment opportunities in missile and spacecraft manufacturing.

The work force in this field of activity has grown very rapidly, from a very small number a few years ago to an estimated 500,000 people by mid-1961. About one-fourth of these half-million people are women. The work force is engaged not only in actual production operations but also in research, design, and development work connected with missiles and spacecraft.

Jobs in missile and spacecraft manufacturing are found in many States, although roughly one-third of them are concentrated in California. Establishments in this line of work range in size from the large factories of major producers, each with thousands of employees, to the shops of small subcontractors and suppliers with only a few workers each. The chief types of employers are aircraft companies, electronics firms, industrial chemical companies, university laboratories and other research organizations, and such Federal agencies as the Air Force, Navy, Army, and National Aeronautics and Space Administration (NASA).

Physicists check shock tunnel used to test scale models of spacecraft and components

A Field of Dynamic Activity

Some work on rockets and upper atmosphere studies has been going on for several decades, but, as already noted, a nearly revolutionary growth has taken place in this field over the past few years. This growth has been caused mainly by two recent events.

The first of these events was the development in 1952-53 of a thermonuclear warhead small enough to fit inside the nose cone of a missile. This made it practical to develop long-range military missiles. As a result, expenditures on missile production increased

*This article describes some new job opportunities and kinds of work in the fast-growing field of missile and spacecraft manufacturing. For a more complete discussion of this field, see the chapter on "Occupations in Aircraft, Missile, and Spacecraft Manufacturing" in the 1961 edition of the Occupational Outlook Handbook.

over fiftyfold during the 1950's. More than 40 types of missiles are currently being produced or developed.

The second event was the Soviet Union's launching of Sputnik I in October 1957. The first American space satellite was successfully launched soon after, in January 1958. Between then and June 1961, the United States put into orbit a total of 42 satellites--an average of 1 a month. Twenty-five of the 42 were still orbiting in June 1961, 23 around the earth and 2 around the sun. The first American space vehicles had payloads, or useful cargo, weighing only 20-30 pounds or less. By mid-1961, the United States was regularly putting into orbit payloads of several hundred pounds and was developing a Saturn rocket capable of launching payloads as heavy as 25 tons.

The pace of technological development in missile and spacecraft manufacturing has been extremely rapid during the 4 years since Sputnik I. It will almost certainly continue so in the years immediately ahead. Changes occur so swiftly that much equipment becomes obsolete while still in the experimental stage or soon after being put into operation.

Nearly half of the money now being spent for missiles and spacecraft is for research and development (R&D). This is an unusually high percentage compared with other industries, and is one of the distinctive features of work in this field. Much R&D effort is devoted to designing and engineering improved missile and space products, making them more reliable and versatile in performance and cheaper to produce. Engines with more power are needed, as well as metals, plastics, and electronic systems with wider capabilities.

What Are Missiles and Spacecraft?

Missiles and spacecraft are complex mechanisms, basically consisting of two major parts. These are the launching vehicle (or rocket) and the payload (or useful cargo).

The launching vehicle contains the engine, which propels the missile or spacecraft, and the electronic guidance and control systems, which direct it. Launching vehicles may have more than one engine or "stage"--as many as five or six in some cases. These stages are placed on top of one another and constructed so that each is ignited when the one before it has exhausted its propellant fuel.

Launching vehicles are powered by rocket engines (and are therefore known as "rockets"). These engines have more power or "thrust" than any other type of engine. Also, they can operate in airless space, whereas other types, such as jet and piston engines, need oxygen from the air for combustion. Today's rockets are powered by chemical propellants, which may be either liquid or solid. New sources of rocket propulsion may be available in the future, such as nuclear energy or electrical energy in the form of ion or plasma power.

Many rockets can be used interchangeably, to launch either a missile or a space vehicle. The major distinction between missiles and space vehicles lies not so much in their launching vehicle as in the nature of their payload.

A missile is a military weapon and typically carries a destructive warhead as its payload. The payload of a space vehicle, on the other hand, consists of electronic instruments designed to "sense" and measure conditions during flight and transmit the data to receiving stations on earth. Payloads in manned spacecraft also include a cabin capsule for astronauts.

Many different types of missiles are made. Some can travel only a few miles and are intended for such purposes as the support of ground troops and defense against tanks and low-flying aircraft. Others, such as the Polaris, Thor, and Jupiter, can travel from 1,200 to 1,800 miles. They are known as intermediate-range ballistic missiles (IRBM's). The largest missiles, such as the Atlas, Titan, and Minuteman, have ranges of 5,000 miles or more and

are called intercontinental ballistic missiles (ICBM's). Some missiles are launched from land or underground sites; others, from aircraft, submarines, ships, or trains.

Space vehicles also are produced in a wide variety of types. Some probe the space environment and then either fall back to earth or escape beyond the earth's gravitational field. Others, such as those in the Explorer, Pioneer, Discoverer, and Tiros series, are put into orbit and become artificial satellites of the earth, sun, or other celestial body.

Space probes and satellites have furnished much valuable information about conditions in the upper atmosphere and in space. They have many useful applications in such fields as meteorology, navigation, communications, surveillance, and astronomy. Unmanned space flights to the moon and to other planets of the solar system are scheduled for the 1960's, as well as experimental missions connected with manned space flight. Space technology is rapidly extending man's horizons beyond his home planet and making this generation the participants in another age of great discovery.

Occupations in Missile and Spacecraft Work

Engineers, Scientists, and Supporting Technicians. As of mid-1961, more than 100,000 engineers, scientists, and supporting technicians were engaged in missile and spacecraft manufacturing. They represented over 20 percent of the estimated half-million workers in this field. This percentage is high compared with most other manufacturing industries, mainly because of the greater emphasis on research and development in missile and spacecraft work. It is estimated that about seven times as many engineers as scientists are employed, and nearly twice as many engineers and scientists as supporting technicians.

The majority of these workers are engaged in research and development. The rest do other work which requires an engineering, scientific, or technical background, such as production planning and quality control, tool designing, technical purchasing, technical sales and service, and technical writing and illustrating.

Many kinds of engineers, scientists, and supporting technicians are employed in missile and spacecraft work. Some of the more important ones are given in the following two lists. The lists are not meant to be all-inclusive. Job titles, especially for supporting technician occupations, are not standardized, and different employers may use different designations for the same job.

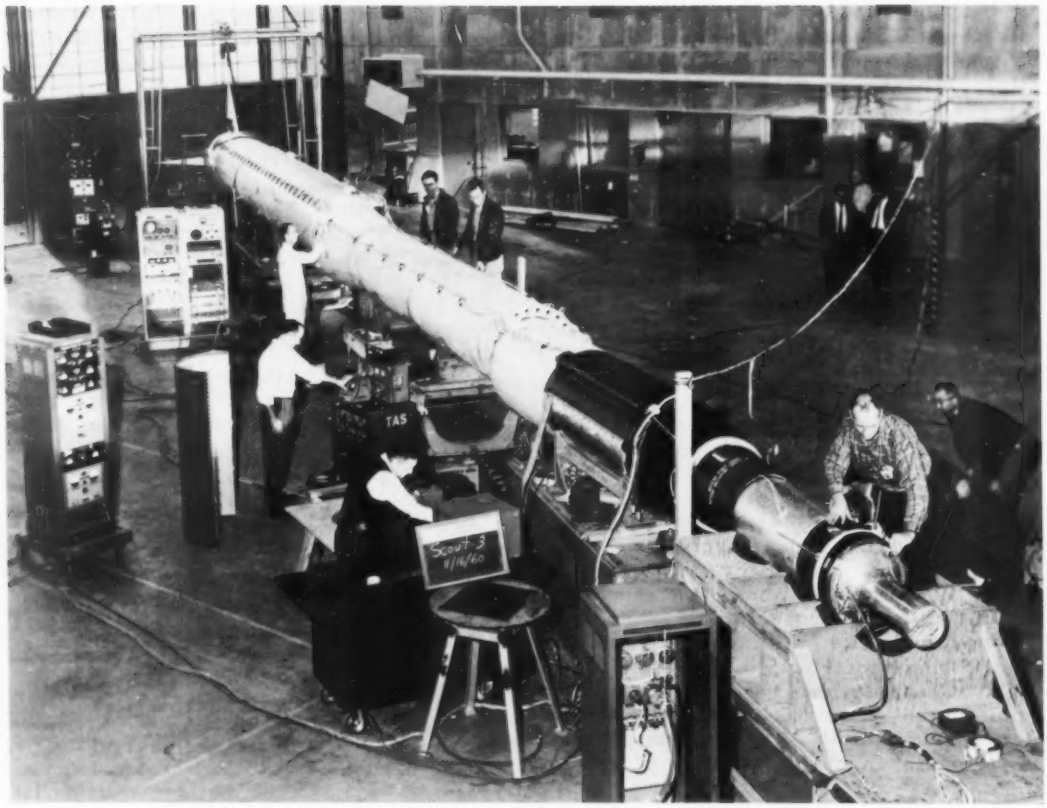
Engineers and scientists:

- Aerodynamicist
- Aeronautical engineer
- Astronomer
- Astrophysicist
- Biologist
- Ceramic engineer
- Ceramicist
- Chemical engineer
- Chemist
- Civil engineer
- Communications engineer
- Design engineer
- Electrical engineer
- Electronic engineer
- Geologist
- Geophysicist
- Human factors engineer
- Industrial engineer
- Mathematician
- Mathematical statistician
- Mechanical engineer
- Metallurgical engineer
- Metallurgist
- Meteorologist
- Nuclear engineer
- Nuclear physicist
- Physicist
- Physiologist
- Psychologist
- Structural engineer

Technicians who work with engineers and scientists:

- Aerodynamics analyst
- Ceramic analyst
- Computer programmer
- Design draftsman
- Electronic technician
- Engineering aid
- Engineering technician
- Experimental technician
- Instrumentation technician
- Laboratory technician
- Mathematics aid
- Physical science aid
- Power plant technician
- Stress analyst
- Systems test technician
- Technical illustrator
- Technical writer
- Tool designer

These occupations are general ones for the most part, and various specializations within them may be found in missile and spacecraft work. Among



Technicians perform final instrument tests on 4-stage launching vehicle

technicians, for example, a laboratory technician may specialize in systems testing, rocket engine design, or some other field; an electronic technician may specialize in experimental electronics, guidance and control systems, or some other field; and so on. For engineers and scientists, fields of specialization are many and varied. This is evident from the following list of some of the specialties in research and development work on missiles and spacecraft:

Fluid and flight mechanics and dynamics, including flight vehicle acoustics, heat transfer, control and guidance systems, and trajectory-orbit analysis;

Energy and power systems, including nuclear propulsion, chemical propulsion, electrical propulsion, and friction and lubrication;

Space sciences, including aeronomy, ionospheric studies, lunar and planetary studies, and stellar and galactic studies;

Life sciences and systems, including flight physiology, radiology and radiation biology, behavioral studies, and environmental control;

Measurement and control systems, including sensors and transducers, heat and light measurement, radio frequency systems, and automated control systems;

Experimental facilities and techniques, including nuclear facility

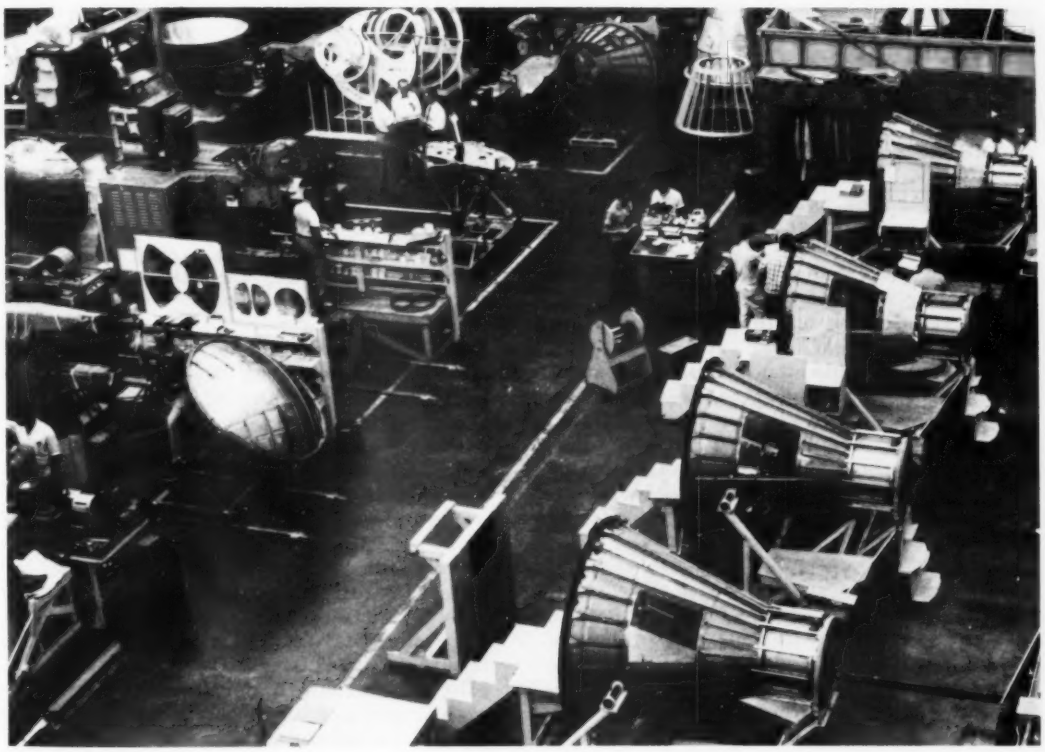
techniques, electrical experimental equipment, launching systems and techniques, and flight vehicle experimental techniques;

Data systems, including theoretical computation techniques and theoretical simulation techniques;

Materials and structures, including structural mechanics, flight structures, and basic properties of materials.

Blue-Collar Workers. Many thousands of craftsmen and other skilled manual workers are employed in missile and spacecraft manufacturing. They are engaged in research and development work, in production, and in maintenance. Those engaged in research and development are usually highly skilled craftsmen who help engineers and scientists by building and installing models, equipment, and other special apparatus for experimental and test projects. Those in production work are engaged in fabricating, installing, assembling, testing, and inspecting the thousands of parts and components which go into missiles and spacecraft. They also make the special tools, dies, jigs, and fixtures needed to manufacture the particular type of vehicle in production. Maintenance craftsmen repair and service machinery and buildings to keep them in good operating condition.

Craftsmen in missile and spacecraft manufacturing must work to extremely close tolerances and must produce parts to very precise measurements. This is because of the absolute reliability required of every component and sys-



Skilled assembly mechanics install components in cabin capsules. Astronaut Alan B. Shepard rode a capsule of this type on America's first manned space flight in May 1961

tem. Someone has estimated that if every one of the 300,000 parts in an average missile worked properly 99-44/100 percent of the time, to use a high figure popularized as being close to perfection, no missile would ever find its target. Even this degree of reliability is too low for successful missile operation.

The percentage of semiskilled and unskilled blue-collar workers employed on missiles and spacecraft is small compared with most manufacturing activities. This is partly because the complex and changing nature of the products being made requires many professional and technical workers and many skilled craftsmen. It is also because the manufacture of missiles and spacecraft does not normally involve high production volumes and long assembly lines, where large numbers of semiskilled workers ordinarily are needed. Only a few hundred units are made of any type of missile, except those of very small size, and the typical space vehicle is produced in even smaller quantities.

Administrative, Clerical, and Related Workers. Office personnel, such as managers, accountants, secretaries, and clerks, represented over one-fifth of all workers in missile and spacecraft manufacturing in mid-1961. This proportion is higher than that in most other types of industrial activity, mainly because missiles and spacecraft are manufactured under an elaborate system of contracts and subcontracts which require many office workers to negotiate, supervise, and administer. This system has developed because almost everything must be custom built under contract and cannot simply be ordered from the stocks of wholesale dealers.

The contract system normally works in the following way. One company, known as the prime contractor, manages and coordinates production of a craft. This company may do some of the production work--most frequently, the final assembly of the vehicle--but usually contracts much of it to other firms. On most projects, the number of these firms, called subcontractors, is very large. For example, an estimated 50,000 subcontractors produce equipment for guided missiles. As production work progresses, it is subject to periodic inspections by the Federal agency which ordered the vehicle. Nearly all of this country's missiles and spacecraft are built for the Air Force, Navy, Army, or the National Aeronautics and Space Administration.

Planning A Career in Missile and Spacecraft Work

Young men and women interested in the missile and spacecraft field should realize that the basic education and training needed are not much different from that required for the same types of work in other research-oriented industries. This is so even though many missile and space products were not even dreamed of a few years ago except in science fiction. It is true that to produce these items basic occupational skills are applied in some highly distinctive and specialized ways, but the specific knowledge needed for such application is generally obtained from experience and training received after starting on the job. The young person planning a career in this field of activity should, therefore, concentrate on obtaining a well-rounded background in the profession, craft, or other occupation of his choice.

For professional employment in this field, for example, the undergraduate college student should try to get as thorough a grounding as possible in fundamental concepts and basic general areas of engineering and science. Mathematics and physics are especially important, regardless of the student's field of study, since these sciences provide the language used by the variety of engineers and scientists engaged on any given project. The applied knowledge needed to work in one of the professional specialties in the industry usually is obtained through actual job experience and graduate-level university work. Advanced courses frequently are taught by senior staff members of missile and spacecraft companies, since course material is often so new and

specialized and so rapidly changing that only those actually working in the specialty know it well enough to teach it.

Many missile and spacecraft plants sponsor formal training for their employees. This supplements day-to-day job experience and helps workers advance more rapidly to higher skills and better paid jobs. It also serves to bridge the gap between the general background of the average person entering the industry and the more particular knowledge he may need for actual application of his skills to missile and spacecraft work. Metal workers may have to learn to work to extremely close tolerances; welders, to work with new kinds of metals; assembly workers, to handle miniature parts so tiny they must be assembled under a microscope; and so on.

Some plants conduct their own classes, others pay tuition and related costs for outside courses taken by their employees, and some plants do both. Classes may be held during working hours, in which case trainees are paid for class time, or after working hours. Courses covering many skills and areas of knowledge are available for practically every occupational group from professional employees to unskilled workers. Most courses are short-term and are designed to meet such immediate skill needs as blueprint reading and shop mathematics. Others, such as apprenticeship programs, are scheduled to run for several years.

More Jobs Expected During 1960's

Thousands of employment opportunities are expected to develop in missile and spacecraft manufacturing during the 1960's. Most of these will be created by expanding activity. Others will result from the need to replace workers who transfer to other industries, retire, or die.

The future of this area of work depends mainly on Government spending, since nearly all our missiles and spacecraft are produced for Federal agencies. (Some spacecraft are being developed for commercial application by private enterprise, and this small part of the field may grow larger during the years ahead.) Government expenditures for missiles and space vehicles are expected to rise during the 1960-70 decade, unless the international situation changes significantly from that prevailing in mid-1961.

Most new job openings over the next decade will be in the spacecraft field, especially in research and development work and in the production of electronic systems and components. The number of jobs in the missile field is not expected to change much during the 1960's, after the sharp rise which occurred during the last few years of the 1950's.

The kinds of workers expected to be most in demand in missile and spacecraft manufacturing in the future are those who have had relatively long periods of education and training. These include various types of engineers, scientists, and supporting technicians, and research craftsmen, maintenance craftsmen, skilled assemblers and inspectors, and other highly trained blue-collar workers.

The number of new job openings for semiskilled and unskilled blue-collar workers in missile and spacecraft manufacturing is also expected to increase during the 1960's, although not so fast as new jobs for other occupational groups. Firms in this field of work will probably concentrate even less than they do now on assembly-line production, which requires large numbers of semiskilled operators, and even more on research, development, and the custom production of relatively small numbers of many diversified products.

Although the overall employment trend appears to be upward, layoffs may occur in plants when work on a contract is terminated. Semiskilled and unskilled workers are more liable than other employees to be laid off during such production cutbacks. Also, some of the new jobs in missile and spacecraft manufacturing will probably be filled by people now producing aircraft, since the number of jobs in aircraft

Inspectors check electronic guidance equipment for missiles

manufacturing is expected to decrease during the 1960's. Plants making aircraft frequently are engaged in some phase of missile and spacecraft manufacturing as well, and many job skills are transferable from aircraft to missile and spacecraft work.

The manufacture of missiles and space vehicles opens up prospects for such things as manned space flight, further discoveries about the universe, weather control, and simultaneous world-wide television. The way already seems open for the exploration of some 39 "worlds" in the solar system--our moon and the 8 other planets and their 30 moons. Interplanetary space is man's newest frontier, and many more workers with high levels of education and skill will be needed to build the craft to pioneer it.

UNION WAGE SCALES AND HOURS IN CONSTRUCTION, PRINTING, LOCAL TRUCKING, AND LOCAL TRANSIT *

As of July 1, 1960, union hourly wage scales[1] were higher than a year earlier in each of the four industries surveyed annually by the BLS--building construction, printing, local transit, and local trucking. Percentage increases over the 12-month period were 2.9 in printing, 3.9 in local transit, 4.1 in building construction, and 4.3 in local trucking in cities with a population of 100,000 or more.

Building Trades

Union hourly wage scales of building-trades workers rose an average of 14 cents during the year ending July 1, 1960. The average local increases ranged from 6.8 cents an hour in Jacksonville, Florida, to 22.5 cents an hour in Los Angeles, California. Two-thirds of the 33 trades surveyed showed average scale advances of 12 to 16 cents an hour over the 12-month period.

The new union hourly wage scales in the cities surveyed averaged $3.66 for all building-trades workers combined--$3.86 for the 650,000 journeymen and $2.88 for the 160,000 helpers and laborers. The average local pay scales for journeymen ranged from $3.11 in Charlotte, North Carolina, to $4.47 in Newark, New Jersey. For helpers and laborers, the range was from $1.47 in Charlotte to $3.74 in New York City. Average union hourly wage rates for selected building tradesmen and helpers in 54 large cities are shown in table 1.

Straight-time workweeks for all building-trades workers averaged 39.3 hours, unchanged from the previous year. Workweeks of 40 hours were predominant, covering seven of every eight building-trades workers.

Printing Industry

Negotiated wages scales for 110,000 union printing-trades workers also continued to move upward during the year ending July 1, 1960. Hourly wage scales rose an average of 9 cents--10 cents in book and job shops and 8 cents in newspaper establishments.

The new union hourly scales averaged $3.23 for all printing-trades workers studied--$3.08 in book and job shops and $3.48 in newspaper plants (table 2). In both types of establishments, average hourly scales varied widely from one occupation to another and from one city to another. Generally, wage rates were highest in the largest cities studied (those with a population of 1 million or more) and lowest in the smallest cities (population of 100,000 to 250,000). An overlapping of average scales existed, however, among the cities in the different size groups for both types of establish-

*This article is one in a series presenting current information on fields of work covered in the 1959 edition of the Occupational Outlook Handbook. The data were compiled by the Bureau of Labor Statistics from its annual survey of union wage scales and scheduled hours of work for specified crafts or jobs as provided in labor-management agreements in effect in over 50 cities with populations of 100,000 or more.

The full reports on the earnings, hours, and supplementary benefits of these four groups of workers are available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at the prices quoted:

Union Wages and Hours, Local-Transit Operating Employees, July 1, 1960, BLS Bull. 1289 (1961), price 15 cents.

Union Wages and Hours: Building Trades, July 1, 1960, BLS Bull. 1290 (1961), price 35 cents.

Union Wages and Hours: Motortruck Drivers and Helpers, July 1, 1960, BLS Bull. 1291 (1961), price 25 cents.

Union Wages and Hours: Printing Industry, July 1, 1960, BLS Bull. 1292 (1961), price 35 cents.

[1]Union wage scales are the minimum wage scales or maximum schedules of hours agreed upon through collective bargaining between trade unions and employers. Rates which are higher than the negotiated minimum, and which may be paid for special qualifications or other reasons, are not included.

ments. For example, the average scale for Oakland (in the 250,000--500,000 population group) was exceeded by that of only one of the larger size cities in the newspaper branch and by none of those in the commercial branch.

Weekly work schedules at straight-time rates of pay averaged 36.6 hours on July 1, 1960, compared with 36.7 hours on July 1, 1959. The most common workweek, 37½ hours, was applicable to 43 percent of the workers. Straight-time workweeks of 36¼ hours were in effect for 32 percent of the printing craftsmen, while those of 35 hours prevailed for 19 percent.

Table 1. Average union hourly wage scales[1] for selected building trades in 54 cities, July 1, 1960

City	Bricklayers	Carpenters	Electricians[2]	Painters	Plasterers	Plumbers	Building laborers
Atlanta, Ga.	$4.000	$3.350	$3.750	$3.300	$3.500	$3.700	$2.000
Baltimore, Md.	4.100	[3]3.600	3.850	3.400	3.850	3.840	2.225
Birmingham, Ala.	3.950	3.150	3.775	3.300	3.270	3.580	1.900
Boston, Mass.	4.050	3.650	3.900	3.225	3.650	3.900	2.750
Buffalo, N.Y.	4.115	4.135	4.250	3.650	4.110	3.875	3.010
Charlotte, N.C.	3.200	2.500	3.000	----	2.750	3.250	1.450
Chicago, Ill.	4.225	3.910	4.100	3.750	4.000	4.050	3.025
Cincinnati, Ohio	4.025	3.900	4.090	3.400	3.875	3.975	2.900
Cleveland, Ohio	4.085	4.110	4.170	3.725	4.110	3.910	3.370
Columbus, Ohio	4.060	3.610	3.860	3.300	3.700	3.825	3.700
Dallas, Tex.	4.000	3.350	3.625	3.313	3.750	3.700	1.850
Dayton, Ohio	4.020	3.725	4.050	3.420	3.770	3.850	2.685
Denver, Colo.	4.000	3.600	3.890	3.250	3.825	3.950	2.320
Des Moines, Iowa	3.975	3.525	3.825	3.300	3.675	3.825	2.800
Detroit, Mich.	3.980	3.630	4.000	3.500	3.750	3.835	2.900
Erie, Pa.	4.100	3.615	3.875	3.250	3.700	3.875	2.675
Grand Rapids, Mich.	4.075	3.500	3.650	3.050	3.500	3.800	2.700
Houston, Tex.	4.000	3.440	3.925	3.225	3.750	3.625	2.050
Indianapolis, Ind.	4.000	3.550	3.850	3.500	3.825	3.850	2.450
Jacksonville, Fla.	3.600	3.150	3.650	2.900	3.500	3.650	----
Kansas City, Mo.	4.075	3.625	3.750	3.550	3.875	3.750	2.580
Knoxville, Tenn.	3.925	3.225	3.500	2.900	3.525	3.625	2.000
Little Rock, Ark.	3.700	3.200	3.475	2.813	3.400	3.425	1.750
Los Angeles, Calif.	4.200	3.825	4.650	3.730	4.250	4.330	3.080
Louisville, Ky.	3.975	3.575	[4]3.850	3.325	3.600	3.750	2.575
Memphis, Tenn.	3.800	3.200	3.575	3.150	3.500	3.710	1.750
Milwaukee, Wis.	3.820	3.570	3.730	3.320	3.550	3.680	2.790
Minneapolis, Minn.	3.875	3.500	3.700	3.390	3.600	3.620	2.850
Newark, N.J.	4.650	4.500	4.500	3.850	4.650	4.250	3.600
New Haven, Conn.	3.850	3.550	3.925	3.400	3.850	3.900	2.800
New Orleans, La.	3.675	[5]3.250	3.900	2.875	3.270	3.700	1.875
New York, N.Y.	4.800	4.550	4.150	3.500	4.700-4.950	4.450	3.800
Oklahoma City, Okla.	4.000	3.275	3.750	3.125	3.625	3.850	2.350
Oakland, Calif.	4.150	3.725	4.205	3.670	3.840	4.350	3.045
Omaha, Nebr.	3.950	3.550	3.850	3.150	3.750	3.830	2.475
Peoria, Ill.	4.325	3.900	4.100	3.600	4.175	4.150	3.250
Philadelphia, Pa.	4.250	3.885	4.375	3.375	4.150	4.100	2.600
Pittsburgh, Pa.	4.450	[3]3.975	4.600	3.700	4.205	4.150	2.725
Portland, Oreg.	4.070	3.460	3.950	3.380	3.780	3.840	2.790
Providence, R.I.	3.925	3.400	3.700	3.050	3.925	3.650	2.650
Richmond, Va.	3.750	2.900	3.400	2.450	3.290	3.500	1.580
Rochester, N.Y.	4.160	3.825	4.120	3.550	4.160	3.700	2.860
St. Louis, Mo.	4.050	3.825	4.110	3.690	3.800	4.150	2.875
St. Paul, Minn.	3.875	3.500	3.650	3.300	3.600	3.620	2.850
Salt Lake City, Utah	3.840	3.300	3.720	3.100	3.725	3.780	2.275
San Antonio, Tex.	3.730	3.250	3.625	3.000	3.625	3.640	1.600
San Francisco, Calif.	4.250	3.725	4.205	3.670	3.790	4.360	3.045
Scranton, Pa.	3.750	3.175	3.625	2.875	3.650	3.875	2.450
Seattle, Wash.	4.150	3.380	3.950	3.465	3.720	3.890	3.000
Spokane, Wash.	4.120	3.480	3.900	3.390	3.800	3.890	2.750
Springfield, Mass.	3.750	3.430	3.750	3.175	3.750	3.800	2.550
Syracuse, N.Y.	4.050	3.670	4.200	3.350	3.925	3.680	2.900
Toledo, Ohio	4.020	3.910	4.000	3.630	3.870	3.950	3.030
Washington, D.C.	4.150	3.750	4.400	3.690	3.925	4.160	2.500

[1]These scales represent the minimum wage rates (excluding holiday and vacation payments regularly made or credited to the workers each pay period) agreed upon through collective bargaining between employers and trade unions. [2]Inside wiremen. [3]Includes millwrights and piledrivers. [4]Includes fixture hangers. [5]Includes piledrivers.

Table 2. Average union hourly wage rates in the printing trades, July 1, 1960

Trade	Average hourly wage rate, July 1, 1960
All printing trades	$3.23
Book and job[1]	$3.08
Bindery women	1.87
Bookbinders	3.18
Compositors, hand	3.37
Electrotypers	3.64
Machine operators	3.37
Machine tenders (machinists)	3.36
Mailers	2.96
Photoengravers	3.94
Press assistants and feeders	2.75
Pressmen, cylinder	3.33
Pressmen, platen	3.02
Stereotypers	3.70
Newspaper	3.48
Daywork	3.36
Nightwork	3.59
Compositors, hand	3.49
Daywork	3.40
Nightwork	3.59
Machine operators	3.52
Daywork	3.42
Nightwork	3.61
Machine tenders (machinists)	3.53
Daywork	3.44
Nightwork	3.62
Mailers	3.19
Daywork	3.05
Nightwork	3.31
Photoengravers	3.82
Daywork	3.73
Nightwork	3.93
Pressmen (journeymen)	3.52
Daywork	3.37
Nightwork	3.68
Pressmen-in-charge	3.83
Daywork	3.67
Nightwork	4.02
Stereotypers	3.47
Daywork	3.34
Nightwork	3.63

[1]Day-shift rates; night-shift rates were excluded from the survey since relatively few workers are employed on night shifts.

Motortruck Drivers and Helpers

Union hourly wage scales of local motortruck drivers and helpers advanced an average of 10.8 cents during the year ending July 1, 1960.

Higher wage scales were reported for nine-tenths of the 313,000 workers, of whom 275,000 were motortruck drivers and 38,000 were helpers. Increases ranged from 10 to 15 cents an hour for slightly more than two-fifths of the workers. Hourly advances of 5 to 10 cents applied to a fifth of the workers, as did those of 15 cents or more.

Table 3. Average union hourly wage rates for motortruck drivers and helpers in 52 cities, July 1, 1960

City	Average hourly wage rates, July 1, 1960	
	Drivers	Helpers
Atlanta, Ga.	$2.59	----
Baltimore, Md.	2.40	$2.19
Birmingham, Ala.	2.52	1.29
Boston, Mass.	2.46	2.24
Buffalo, N.Y.	2.67	2.39
Charlotte, N.C.	2.56	----
Chicago, Ill.	2.76	2.47
Cincinnati, Ohio	2.68	2.60
Cleveland, Ohio	2.78	2.28
Columbus, Ohio	2.68	1.88
Dallas, Tex.	2.56	2.44
Dayton, Ohio	2.68	2.13
Denver, Colo.	2.40	2.04
Des Moines, Iowa	2.55	2.65
Detroit, Mich.	2.81	2.47
Erie, Pa.	2.58	2.51
Grand Rapids, Mich.	2.68	2.32
Houston, Tex.	2.39	1.89
Indianapolis, Ind.	2.69	2.41
Jacksonville, Fla.	2.58	----
Kansas City, Mo.	2.57	2.53
Knoxville, Tenn.	2.53	1.25
Little Rock, Ark.	2.42	2.01
Los Angeles, Calif.	2.87	2.55
Louisville, Ky.	2.58	2.38
Memphis, Tenn.	2.48	1.28
Milwaukee, Wis.	2.71	2.54
Minneapolis-St. Paul, Minn.	2.70	2.57
Newark, N.J.	2.71	2.21
New Haven, Conn.	2.50	2.31
New Orleans, La.	2.17	1.64
New York, N.Y.	2.70	2.31
Oklahoma City, Okla.	2.45	----
Omaha, Nebr.	2.57	----
Peoria, Ill.	2.84	2.45
Philadelphia, Pa.	2.58	2.39
Pittsburgh, Pa.	2.76	2.64
Portland, Oreg.	2.68	2.46
Providence, R.I.	2.44	2.26
Richmond, Va.	2.45	----
Rochester, N.Y.	2.61	2.47
St. Louis, Mo.	2.72	2.45
Salt Lake City, Utah	2.23	2.07
San Antonio, Tex.	2.60	----
San Francisco-Oakland, Calif.	3.11	3.00
Scranton, Pa.	2.42	2.32
Seattle, Wash.	2.86	2.70
Spokane, Wash.	2.73	2.64
Springfield, Mass.	2.48	2.25
Syracuse, N.Y.	2.59	2.47
Toledo, Ohio	2.63	2.52
Washington, D.C.	2.22	1.96

Note: Dashes indicate no data available.

The new union hourly scales for local motortruck drivers and helpers averaged $2.65--$2.68 for drivers and $2.38 for helpers. Average hourly scales for motortruck drivers among the individual cities studied ranged from $2.17 in New Orleans to $3.11 in San Francisco-Oakland. Rates averaged $2.50 to $2.75 in 30 cities, $2.25 to $2.50 in 11 cities, and $2.75 or more in 8 others. For drivers' helpers, hourly scales averaged highest ($3) in San Francisco-Oakland and lowest ($1.25) in Knoxville. (See table 3.)

The trend toward a shorter straight-time workweek continued, averaging 40.1 hours on July 1, 1960, compared with 40.2 hours a year earlier. Workweeks of 40 hours were predominant and affected 9 of every 10 workers.

Local-Transit Operating Employees

Hourly wage scales of unionized local-transit operating employees advanced an average of 8.8 cents between July 1, 1959, and July 1, 1960.

Rates were adjusted upward for 92 percent of the transit workers included in the survey. Scale increases of 8 to 10 cents an hour affected a third of the workers and of 10 to 14 cents, almost another third. Raises of 14 cents or more were applicable to a tenth of the workers as were those of less than 6 cents.

The new union hourly wage rates averaged $2.37 for operators of local-transit equipment. Local pay scales in the cities studied ranged from $1.68 in Charlotte, North Carolina, to $2.58 in Chicago, Illinois. (See table 4.) Hourly scales averaged less than $2 in 9 cities, $2 to $2.25 in 19 cities, and $2.25 to $2.50 in 18 cities. Except for Houston, Texas, all cities with a half million or more population averaged over $2.25 an hour.

Straight-time workweek schedules were reported for 95 percent of the operating employees included in the transit industry. Such schedules, which varied from 40 to 51 hours a week, averaged 40.6 hours. Workweeks of 40 hours were stipulated in labor-management agreements applicable to about 85 percent of all transit operators.

Table 4. Average union hourly wage rates of local-transit operating employees in 52 cities, July 1, 1960

City	Average hourly wage rate, July 1, 1960
Atlanta, Ga.	$2.09
Baltimore, Md.	2.27
Birmingham, Ala.	1.98
Boston, Mass.	2.52
Buffalo, N.Y.	2.30
Charlotte, N.C.	1.68
Chicago, Ill.	2.58
Cincinnati, Ohio	2.29
Cleveland, Ohio	2.37
Columbus, Ohio	2.35
Dallas, Tex.	2.09
Dayton, Ohio	2.23
Denver, Colo.	2.13
Des Moines, Iowa	2.23
Detroit, Mich.	2.47
Erie, Pa.	2.15
Grand Rapids, Mich.	2.00
Houston, Tex.	2.10
Indianapolis, Ind.	2.23
Jacksonville, Fla.	1.86
Kansas City, Mo.	2.24
Knoxville, Tenn.	1.70
Little Rock, Ark.	1.79
Los Angeles, Calif.	2.36
Louisville, Ky.	2.12
Memphis, Tenn.	2.12
Milwaukee, Wis.	2.48
Minneapolis-St. Paul, Minn.	2.56
Newark, N.J.	2.43
New Haven, Conn.	2.16
New Orleans, La.	2.35
New York, N.Y.	2.49
Oklahoma City, Okla.	1.78
Omaha, Nebr.	2.24
Peoria, Ill.	2.10
Philadelphia, Pa.	2.30
Pittsburgh, Pa.	2.55
Portland, Oreg.	2.34
Providence, R.I.	2.12
Richmond, Va.	1.91
Rochester, N.Y.	2.26
St. Louis, Mo.	2.38
Salt Lake City, Utah	1.87
San Antonio, Tex.	2.00
San Francisco-Oakland, Calif.	2.55
Scranton, Pa.	1.95
Seattle, Wash.	2.50
Spokane, Wash.	2.06
Springfield, Mass.	2.14
Syracuse, N.Y.	2.26
Toledo, Ohio	2.30
Washington, D.C.	2.45

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